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ATARI

Applying The Atari

by Jeff Brenner

This month's feature program utilizes a capability of the Atari called the *display list interrupt* to help you liven up your Graphics O display. We'll also look at the reader mail, programming tips, and a recap of instructions for Program Perfect for our newer readers.

Reader Mail

While readers' questions are far from in short supply, I would like to see more letters with contributions, such as short programs or helpful advice, from which other readers may benefit. A three-dimensional, holograph sticker will be sent to each contributor of an item printed in this column. Also, if you have an idea for a program but cannot implement it yourself, send me a program request. If the program will be useful to other readers, it may be developed and printed in a future issue.

I have a Trade-Wind Instruments model A-1 Anemometer I would like to interface with an old Atari 600XL I have. The anemometer has a generator on it so when the wind spins it around it produces a variable voltage which translates into wind speed in mph.

I asked the Trade-Wind folks if they knew anything about doing this but they didn't. They sent me the enclosed reprint from BYTE magazine, but I can't understand what the article is talking about.

I would like to get the wind speed from the anemometer through one of the joystick ports. Then have a program to get the wind speed say once an hour and store it for later retrieval.

I have no idea how to go about doing this; maybe it's impossible? Any help you can give me would be greatly appreciated.

Greg Matlock
Hays, Kansas

The joystick ports on the Atari can be used to read a wide variety of instruments, including your anemometer, providing that interfacing is properly done. A digital anemometer might be the easiest to interface to the Atari since its output is binary-coded

decimal data. This could be read through the ports with a minimum amount of extra circuitry; however, you would have to write a routine to interpret the incoming data.

Since you did not specify whether or not your unit is a digital anemometer, I am assuming that your model simply generates a voltage relative to the wind speed. In that case, you would have to either use a circuit to convert the signal to binary-coded decimal data, or convert the varying voltage into a varying resistance, which could then be read like a game paddle. Specific details for doing this are beyond the scope of this column.

I recommend that you try contacting the author of the article enclosed with your letter. His article discussed interfacing an anemometer to an S-100 system, and he might be able to help you to do the same with your Atari.

I also recommend that you and any other readers interested in interfacing external devices with their Atari computers read "Control Your Environment with the Atari 400/800" (by David Alan Hayes, *BYTE*, July 1983). This gives some general information on controlling and monitoring devices through the joystick ports. Most of what is discussed applies to the XL and newer XE Atari units as well.

You might also attempt to contact a technician at Atari (1265 Borregas Ave., Sunnyvale, CA 94086) to assist you or direct you to other sources.

Interfacing your anemometer to your computer is not an impossibility. First get the details on doing so. Then, if you are not experienced in constructing circuits, get the help of a friend familiar with electronics.

I am strongly considering buying one of the new Atari ST machines when they are released. I have two questions: (1) Are they Macintosh compatible? (2) Would you support the new machines in your "Applying The Atari" column?

Rob Murray
Montgomery, Pennsylvania

Although the Atari ST is known as the "Jackintosh" in certain circles (after Jack Tramiel), it is *not* software compatible with Apple's

Macintosh. Come on now — ultra-high resolution color graphics, multiple ports and interfaces, sound capabilities, and Macintosh compatibility for under \$1000? That would be too much to ask for!

If the new Atari units catch on and if there is demand among readers for information on them, I would certainly devote space to these new models.

Programming Tips

It isn't necessary to go to DOS when you want to format a disk to save a program. Loading DOS (if no MEM.SAV is present) will wipe out the program you're working on. A truly useful method of formatting a disk without leaving BASIC is the XIO command. To format a disk in single density, enter:

XIO 253,#1,33,87,"D:"

For double density (available on the 1050 drive only), enter:

XIO 253,#1,33,127,"D:"

If you do this on a disk that already has programs on it, you will erase the disk, so be careful.

Herb Collins
Long Beach, California

I have discovered one cause of the infamous Atari 400/800 BASIC hang-up in which the Atari refuses to process user input. It seems that pressing SYSTEM RESET while the computer is in the middle of certain operations can mess things up.

For example: you type PRINT A\$ to print out A\$, a long string. The computer hesitates, and you, fearing that a system crash might be

developing, press SYSTEM RESET in your attempt to avert disaster. However, when you now try to enter a line, the computer hangs up. Had you waited two to three seconds for the string to be printed out, everything would have been fine — Atari BASIC normally hesitates when printing out a long string while it rearranges its memory. But pressing SYSTEM RESET might leave the Atari in some kind of half-rearranged memory state — probably sufficient cause for a BASIC crash.

You should wait for the READY prompt before pressing SYSTEM RESET, and use BREAK instead of the reset key to interrupt program execution to greatly reduce the occurrence of the hang-up. [Atari

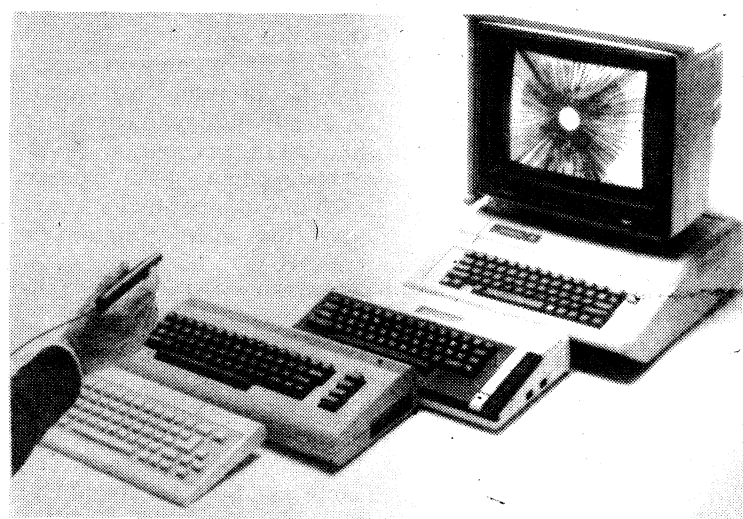
Continued on page 54

Space Tablet Introduced At Winter CES

Soniture, Inc. introduced a new dimension in personal computing. The product introduced was a 3D input device to all the popular personal computers called the Space Tablet.

The Space Tablet is comprised of a receiver frame that can be placed anywhere but is most appropriately positioned on top of the computer display, and a pencil like pointer (transmitter) that is held in the hand of the user at a distance of up to six feet in front of the receiver frame. The receiver frame detects the position of the pointer in all three dimensions (X,Y,Z) and reports that information to the software via the joystick port on all of the popular home and personal computers (Atari, Apple, Commodore, IBM PC and PCjr).

The Space Tablet utilizes patent pending ultrasonic technology for the detection and measurement of the three dimensional coordinates of the sonic pointer within the field of the receiver. The direction of the pointer is not critical and it is envisioned to be attached to other devices operating in the six feet field of detection in front of the television or com-



puter monitor in applications of entertainment, education, or industry.

"The computer keyboard is a creature of habit that is rapidly being bypassed as a computer controlling device," comments Paul Terrell, President of Soniture, Inc. "the recent popularity of mice, touch tablets, and light pens support that theory but they fall short of the main objective in making the human interface more natural because they lack the ability of reporting the third dimension or "Z" axis and they require you to develop a new

coordination of moving your hand in one area while you are looking in another direction."

Soniture is marketing the Space Tablet as a stand alone product through computer specialty stores and mass merchants. A Software Sampler diskette is included with the Space Tablet so that the consumer will be able to operate the product out of the box. Soniture will provide a sample version of popular programs from major publishers as a teaser to the consumer to pur-

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Applying The Atari

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says that this bug has been rectified in the BASIC in the XL and XE models, so this tip applies only to 400 and 800 owners.]

G. Scott
Bronx, New York

Program Perfect Recap

Last month, Program Perfect was listed in its entirety for those new to *Computer Shopper* and for those who missed the revision that followed the original listing. This also allows us to point to one single issue (April 1985) when referring to this program. This month we'll review the features of Program Perfect and how to use them. If you are already familiar with Program Perfect, you can skip to the "Multi-Luminance Graphics O" section to start entering this month's program.

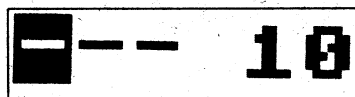
Before we start using Program Perfect, check over your typing a few times to be sure there are no errors. You don't want a bug in a program that checks other programs for errors!

We'll use the short program listed under the "SAMPLE PROGRAM" heading to test Program Perfect. The three letters to the left of each line number is the code used by Program Perfect to check the line for errors, and to determine the next line for its automatic line numbering feature.

SAMPLE PROGRAM

```
CTJ 10 REM TEST OF PROGRAM PERFECT
LAJ 20 PRINT "THIS IS A TEST"
HWJ 30 GOTO 20
DJJ 40 END
```

RUN Program Perfect. When you're asked to enter the starting line, enter the first line of the program you are entering. In the case of this demonstration program, enter 10 and press RETURN. Figure 1 shows how the line below will now appear.



The three hyphens preceding the 10 are for the three-letter code. When you type the code for line 10, the display will appear as in Figure 2.



FIGURE 2

The cursor will have moved past the line number to allow you to enter the program line. Type in the remainder of line 10 and press RETURN. Program Perfect will perform a few screen manipulations below the line you have entered as it checks the line for errors and places it in the Atari's memory as a real program line. You'll get a buzz and an "ERROR - TRY AGAIN" message if you've made a syntax error, or if the line does not otherwise check against its three-letter code. An error in typing the three-letter code will also trigger the error message. After the error message is printed, you'll have to enter the three-letter code again, but the rest of the line will remain intact so you may correct it using the cursor control keys. To erase the entire line and the code, press SHIFT-CLEAR. Program Perfect will not allow you to move the cursor out of its three-line entry area.

If the line is entered correctly, the program will automatically display the next line number of the program. Enter to codes and program lines for each line number that appears until the entire program is entered.

Program Perfect allows you to use all abbreviations, such as GR. for GRAPHICS and G. for GOTO. However, do not use ? for PRINT or vice versa as the computer treats these as two different commands. The same goes for GOTO and GO

TO. Use PR. as an abbreviation for PRINT, and stick to the one-word GOTO, as this is the only form that will appear in the programs in this column.

You do not have to follow the exact spacing of the program line unless the spacing is within quotes.

After you enter the last line

of the program (which has a three-letter code ending with a "Z"), Program Perfect will print "END OF PROGRAM - STAND BY." It will then take about five seconds while it erases itself from memory and leaves you only with the lines you have entered. You can then list, save or run your program.

If you don't enter the whole program in one sitting, you can press BREAK and SAVE what you've already typed. Since Program Perfect is in memory, you will be saving it along with the lines of the program you have entered. When you are ready to enter more of the program, simply LOAD it back in and type GOTO 30000 (the beginning line of Program Perfect). Then enter the line number from which you want to continue for the "Starting number:" prompt and enter the rest of the program.

Multi-Luminance Graphics O Screen

This month's program gives you the chance to enhance your Atari's Graphics 0 screen. Graphics 0 is the mode in which you program. With the SETCOLOR command, characters on the Graphics 0 screen can be set to any one of eight luminance levels. However, the Atari operating system does not provide for mixing text of different luminance on the same screen; a feature which can greatly add to the visual appeal of the display. To accomplish this, a display list interrupt could be set up.

The display list is a section of computer memory which contains a series of mode-display instructions for each line of the screen. A Graphics 0 screen would contain 24 instructions to display a line of graphics mode zero text, thereby creating a 24 line display. A display list interrupt is an instruction in this display list which causes the computer to temporarily halt its current operation and to instead jump to some routine in memory. After this routine is executed, the Atari resumes its normal activities. The most important aspect of this display list inter-

rupt routine is that it is executed while the screen is being drawn. Therefore, the Atari's color registers could be changed mid-screen if desired, and the change would be visually apparent on the video display.

The Multi-Luminance program that follows works on this principle. It uses 24 interrupts, one for each line of the screen, and is therefore able to assign a new luminance level to each line of text.

Enter the Multi-Luminance program under Program 1 and LIST it to cassette or diskette so that you may merge it with other BASIC programs. Now, without erasing Program 1, enter Program 2. Program 2 is a sample application program which shows off one use of a display with multi-luminances.

RUN the program. After a few seconds, a display is generated which takes advantage of the many different intensities available. The sample menu shows CHOICE 1 illuminated, while the other choices are dark. By pressing the SELECT key, the next choice is illuminated, and so forth. Pressing START would initiate a particular selection if this menu were being used in a full-length program. In this demonstration, pressing START will tell you what choice was selected.

This attractive method of menu operation could not have been done on the normal Graphics 0 screen. The Multi-Luminance routine (Program 1) sets the line containing the selected choice at the highest

intensity, while it sets the other at the lowest intensity, to obtain this interesting effect.

Next Month

You'll learn how to use the Multi-Luminance program to set each screen line to the luminance of your choice, and how to incorporate this into your own BASIC program. Next month's feature program is a powerful mailing list keeper (name/address/category) for disk systems with search, editing, and double-width label printing capabilities. It works with either single or double density (DOS 2 or DOS 3). This program is one you won't want to miss.

Readers' questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply.

A cassette or diskette of any program listed in this column is available from the author for \$5, postpaid. Specify DOS 2 or DOS 3 when requesting a diskette.

Program Perfect is a utility used to check for typing errors in programs entered from this column. Readers may send a SASE for listing.

Address all correspondence to:

Jeff Brenner's
"Applying The Atari"
c/o Computer Shopper
P.O. Box F
Titusville, FL 32781-9990

PROGRAM 1

```
KLJ 30000 REM MULTI-LUMINANCE PROGRAM
KWJ 30010 REM BY JEFF BRENNER
CFJ 30020 RESTORE 30070: I=0
FWJ 30030 READ NUM: IF NUM=-1 THEN 30050
YVJ 30040 TOT=TOT+NUM+1: POKE 1664+I, NUM: I=I+1: GOTO 30030
RAJ 30050 IF TOT<13108 THEN PRINT "ERROR-CHECK PROGRAM": STOP
HWJ 30060 A=USR(1664): RETURN
TJ 30070 DATA 104, 173, 48, 2, 133, 204, 173, 49, 2, 133, 205, 160, 26, 169, 10
IPJ 30080 DATA 153, 230, 6, 136, 208, 250, 160, 0, 177, 204, 9, 128, 145, 204, 160
UKJ 30090 DATA 3, 177, 204, 9, 128, 145, 204, 160, 6, 177, 204, 9, 128, 145, 204
QBJ 30100 DATA 200, 192, 28, 208, 245, 169, 197, 141, 0, 2, 169, 6, 141, 1, 2
TJ 30110 DATA 173, 14, 212, 9, 128, 141, 14, 212, 96, 72, 152, 72, 173, 11, 212
TBJ 30120 DATA 201, 7, 240, 18, 201, 8, 240, 14, 230, 204, 164, 204, 185, 231, 6
SBJ 30130 DATA 141, 23, 208, 104, 168, 104, 64, 169, 0, 133, 204, 240, 238, -1
```

PROGRAM 2

```
HWJ 10 REM MULTI-LUMINANCE DEMONSTRATION
HWJ 20 GRAPHICS 0: GOSUB 30000: RESTORE 50
EJJ 30 FOR I=1767 TO 1791: READ N: POKE I, N: NEXT I
DJJ 40 SETCOLOR 2, 5, 2: POKE 752, 1
KJ 50 DATA 4, 6, 8, 10, 12, 14, 0, 0, 0, 0, 0, 0, 0, 0, 0, 14, 12, 10, 8, 6, 4
KJJ 60 FOR I=0 TO 5: POSITION 19-I, 1: PRINT CHR$(0);
BLJ 70 IF I<0 THEN FOR J=1 TO 14: PRINT CHR$(160);: NEXT J
JAJ 80 PRINT CHR$(10);: NEXT I
TJ 90 FOR I=0 TO 5: POSITION 19-I, 23-I: PRINT CHR$(138);
DJJ 100 IF I<0 THEN FOR J=1 TO 14: PRINT CHR$(160);: NEXT J
HWJ 110 PRINT CHR$(136);: NEXT I
UNJ 120 FOR I=1 TO 4: POSITION 16, (I-1)*3+7: PRINT "CHOICE "; I: NEXT I: CHOICE=1
EJJ 130 FOR I=1774 TO 1783 STEP 3: POKE I, 0: NEXT I
HJ 140 POKE 1774+(CHOICE-1)*3, 14
FJ 150 CONSOL=PEEK(53279): IF CONSOL=7 THEN 150
PJ 160 IF CONSOL=5 THEN SOUND 0, 100, 10, 8: CHOICE=CHOICE+1: IF CHOICE=5 THEN CHOICE=1
PJ 170 IF PEEK(53279)<>7 THEN 170
CJJ 180 IF CONSOL<>6 THEN SOUND 0, 0, 0, 0: GOTO 130
HJ 190 PRINT CHR$(125): POSITION 6, 5
HWJ 200 PRINT "YOU HAVE SELECTED CHOICE #"; CHOICE; "."
ULJ 210 STOP
```

**Advertising Deadline is the
2nd Monday of each month.**

Space Tablet

Continued from page 53

chase the completed product from the retailer. "Programs are a lot more fun and relaxing to operate when you can sit back in a comfortable chair six feet from the computer and point or wave your hand" said Terrell, "moving chess players on a board, placing musical notes on a score, painting in space, pulling down menus, positioning characters in a scene, zooming in the "Z" dimension, flipping through a file drawer, exploding parts lists, controlling mechanical

arms in 3d on a production line to handling nuclear waste or having a sword fight with your computer at the end of a hard day's work seems natural enough to me."

The Space Tablet with Sampler diskette retails for \$150 with interface to the Atari and Commodore computers, \$175 interfaced to the Apple II, II+, IIe, IIc and IBM PCjr, \$200 interfaced to IBM PC, XT, AT.

For information, contact Soniture, Inc. at 2146 Paragon Drive, San Jose, CA, 95131.

Mention that you read it in the *Computer Shopper*.